(d) controlling the performance of the steps (a), (b), and (c) to enhance, in the output produced, the selectivity of said nerve, while the nerve is living in the *in vivo* region of the subject; and

(e) processing the output to generate a data set describing the shape and position of said nerve, said data set distinguishing said nerve from non-neural tissue, in the *in vivo* region to provide a conspicuity of the nerve that is at least 1.1 times that of [the] any adjacent non-neural tissue, without the use of neural contrast agents.

Please amend Claim 166 as follows:

--166. (Amended) A method of utilizing magnetic resonance to determine the shape and position of mammal tissue, said method including the steps of:

(a) exposing an *in vivo* region of a subject to a magnetic polarizing field that includes a predetermined arrangement of diffusion-weighted gradients, the *in vivo* region including non-neural tissue and a nerve, the nerve being a member of the group consisting of peripheral nerves, cranial nerves numbers three through twelve, and autonomic nerves;

(b) exposing the *in vivo* region to an electromagnetic excitation field;

(c) sensing a resonant response of the *in vivo* region to the polarizing and excitation fields and producing an output indicative of the resonant response, said producing an output indicative of the resonant response including the step of producing a separate output for each diffusion-weighted gradient of said predetermined arrangement of diffusion-weighted gradients;

(d) controlling the performance of the steps (a), (b), and (c) to enhance, in the output produced, the selectivity of said nerve, while the nerve is living in the *in vivo* region of the subject;

(e) processing the output to generate a data set describing the shape and position of said nerve, said data set distinguishing said nerve from non-neural tissue, in the *in vivo* region to provide a conspicuity of the nerve that is at least 1.1 times that of the non-neural tissue, without the use of

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neural contrast agents, said processing the output including the step of vector processing the separate outputs for each said diffusion-weighted gradient of said predetermined arrangement of diffusion-weighted gradients to generate data representative of anisotropic diffusion exhibited by the nerve, and processing said data representative of said anisotropic diffusion to generate said data set describing the shape and position of the nerve.

Please amend Claim 168 as follows:

--168. (Amended) A method of utilizing magnetic resonance to determine the shape and position of mammal tissue, said method including the steps of:

(a) exposing an *in vivo* region of a subject to a magnetic polarizing field, the *in vivo* region including non-neural tissue that [may include] includes blood vessels and a nerve, the nerve being a member of the group consisting of peripheral nerves, cranial nerves numbers three through twelve, and autonomic nerves;

(b) exposing the *in vivo* region to an electromagnetic excitation field;

(c) sensing a resonant response of the *in vivo* region to the polarizing and excitation fields and producing an output indicative of the resonant response;

(d) performing the steps (a), (b), and (c) [a second time] to produce [an] a second output in which the conspicuity of blood vessels is enhanced; and

(e) processing said output indicative of the resonant response and said second output [in which the conspicuity of blood vessels is enhanced] to generate a data set in which conspicuity of the blood vessels is suppressed, said data set describing the shape and position of said nerve[, said data set] and distinguishing said nerve from non-neural tissue, in the *in vivo* region to provide a conspicuity of the nerve that is at least 1.1 times that of the non-neural tissue, without the use of neural contrast agents.--

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